

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8480 (1996): Crop Protection Equipment - Glossary of Terms [FAD 21: Farm Implements and Machinery]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक
फसल संरक्षण उपस्कर — पारिभाषिक शब्दावली
(पहला पुनरीक्षण)

Indian Standard
CROP PROTECTION EQUIPMENT —
GLOSSARY OF TERMS
(*First Revision*)

ICS 01.040.65;65.040.40

© BIS 1996

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 1996

Price Group 3

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Crop Protection Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increasing usage of crop protection equipment, a large number of new equipment is being designed, developed and manufactured in the country. The need was, therefore, felt for a comprehensive glossary which would provide authentic definition of the terms used in respect of crop protection equipment. The terms have been arranged in alphabetical order.

This standard was first published in 1977. This revision has been taken up to incorporate various new terms to crop protection equipment and their components.

In the preparation of this standard, assistance has been derived from ISO/5681:1992 'Equipment for Crop Protection—Vocabulary'.

Indian Standard

CROP PROTECTION EQUIPMENT — GLOSSARY OF TERMS

(First Revision)

1 SCOPE

1.1 This standard covers definitions of terms relating to crop protection equipment.

2 TERMS AND DEFINITIONS

2.1 Agitation — An operation which produces and maintains uniform spray mixture in the tank, and in the case of dusts or granules to facilitate their flow from the hopper.

2.1.1 Hydraulic Agitation — Agitation of the spray mixture by using an auxiliary pump flow or a partial flow of the main pump.

2.1.2 Mechanical Agitation — Agitation of the spray mixture, dust or granules by means of mechanically-operated stirrer inside the tank or hopper.

2.1.3 Pneumatic Agitation — Agitation of the spray mixture, dust or granules inside the tank or hopper using an air flow.

2.2 Agitator — A device used for agitation (*see* 2.1).

2.2.1 Hydraulic Agitator — A device used for hydraulic agitation (*see* 2.1.1).

2.2.2 Mechanical Agitator — A device used for mechanical agitation (*see* 2.1.2).

2.2.3 Pneumatic Agitator — A device used for pneumatic agitation (*see* 2.1.3).

2.3 Air Compressor — An appliance for raising the pressure of air above that of the atmosphere.

2.4 Air Deflector — A device to alter the direction of the air flow.

2.5 Air Flow — Volume of air flowing by an appliance per unit of time.

2.6 Air Flow Control (Shutter) — Part of an appliance to control the air flow.

2.7 Air Output — Volume of air discharged by an appliance per unit of time.

2.8 Anti-Drip Device — A device, which normally forms part of or is fitted within the nozzle, to instantly prevent any further flow or dripping from the nozzle after the spray boom has been shut-off.

2.9 Application Rate — The quantity of spray mixture, dust or granules distributed by an appliance per hectare.

2.10 Automatic Cut-Off Valve — An automatic device which closes when the pressure of the fluid or gas reaches predetermined value.

2.11 Axial Flow Fan (Axial Flow Blower) — An appliance for producing an air flow parallel to the blower shaft.

2.12 Boom Damping System — Part of a suspension system intended to minimize the unwanted movements of the spray boom.

2.13 Boom Suspension System — System by which the boom is attached to the sprayer.

2.14 Boom Winch — Winch used to adjust the height of the spray boom.

2.15 By Pass — A device which allows all or part of the fluid delivered by the pump to be returned to the tank.

2.16 Calibration — Operation of adjusting and checking the application appliance to give the desired application rate.

2.17 Centrifugal/Radial Fan (Centrifugal Blower) — An appliance for producing an air flow at right angles to the blower shaft.

2.18 Chemical Induction Probe — Suction pipe for transferring liquid formulated product from its container into the spray tank.

2.19 Chemical Introduction Bowl — Bowl, which may be lowered, into which formulated product can be poured for transfer to the spray tank.

2.20 Chemical Rack — Fitting on the sprayer for the safe storage and transportation of product containers.

2.21 Clean Water Dispenser — Tank mounted on the sprayer containing clean water for washing.

2.22 Collector Deflector — A device intended to collect and direct an air flow in a definite direction.

2.23 Cross-Flow Fan — Appliance providing a linear air flow at right angles to the appliance shaft.

2.24 Cut-Off Device — A hand-operated mechanism situated between the delivery hose and the spray lance for controlling the flow of the liquid.

2.25 Cycle — One up and one down stroke.

2.26 Deposition — Quantity and distribution of pesticide on the target surface.

2.27 Dose Rate — Mass of active ingredient or of formulated product applied per unit of length, area or volume to be treated.

2.28 Dribble Bar — Spray bar in which the spray liquid is discharged at low pressure through circular holes so forming solid stream.

2.29 Drift — Part of the applied pesticide which is not deposited within the target area.

2.30 Droplet — Substantially spherical liquid particle with a diameter generally less than 1 000 μm .

2.30.1 Droplet Density — Number of droplets deposited per unit surface area (usually 1 cm^2).

2.30.2 Droplet Size — The mean diameter of the droplet expressed in micrometres.

2.31 Dust — Finally divided particles of an inert solid substance carrying the active ingredients and ready for use.

2.32 Duster — An appliance used for dusting (see 2.34).

2.32.1 Knapsack Duster — A duster which could be mounted on the back of the operator.

2.32.2 Mechanical Duster — An appliance used for mechanical dusting (see 2.34.2).

2.32.3 Pneumatic Duster — An appliance used for pneumatic dusting (see 2.34.3).

2.33 Dust Hopper — Container for holding dust.

2.34 Dusting — Application of materials in the form of dust.

2.34.1 Electrostatic Dusting — Process where electrostatic forces are applied for the deposition of dust.

2.34.2 Mechanical Dusting — Distribution of dust by mechanical means.

2.34.3 Pneumatic Dusting — Distribution of dust by means of flow of gas, usually air.

2.34.4 Wet Dusting — Method of treatment comprising the simultaneous emission of dust and a liquid spray.

2.35 Dust Nozzle — A device for directing dust in an air flow.

2.36 Fan (Blower) — An appliance for producing an air flow by means of blade fixed to a rotating shaft.

2.37 Filling Hole — Opening in the top of the tank through which the sprayer can be filled, often equipped with a strainer.

2.38 Flame Gun — An appliance which produces a burning flame under pressure to control weeds, pests, etc.

2.39 Fumigator — An appliance to generate and distribute gases or smokes.

2.40 Gasket — A compressible insert placed between two surfaces to obtain a liquid or gas tight sealing.

2.41 Granules — Particles, within a defined size range, of an inert substance containing or carrying the active ingredients.

2.41.1 Granules Applicator — An appliance for applying materials in the form of granules.

2.41.2 Granules Band Applicator — Machine that applies granules in bands or rows.

2.41.3 Granules Distributor; Granule Spreader — Machine that distributes granules for overall treatment.

2.41.4 Granules Hopper — Container for holding granules.

2.41.5 Granules Metering Mechanism — Part of a granule applicator which controls the flow of granules at desired application rate.

2.41.6 Granules Nozzle — A device for directing granules in an air flow.

2.41.7 Granules Spot Applicator — Machine that applies granules in spots.

2.42 Ground Speed System — Spraying system which varies the output in direct proportion to the forward speed so that a constant application rate is obtained.

2.43 Hydraulic Injector; Filler — A device using the velocity of a jet of liquid to produce a vacuum in a suction pipe for the purpose of filling a tank.

2.44 Injection — The act of forcing a fluid under pressure into another fluid or porous medium.

2.45 Liquid Output — Volume of liquid discharged by an appliance per unit of time.

2.46 Mass-Hectare — Mass of dust, granules or formulated product applied over an area of 1 ha.

2.47 Metering Injection System — System which meters the formulated product into the spray line to the boom at a predetermined rate in proportion to the forward speed.

2.48 Motor Speed System — Spraying system which varies the output in direct proportion to the engine speed within a chosen gear.

2.49 Multi-Outlet Control Valve — A device enabling the flow of the spray mixture to be directed to one or more outlets.

2.50 Non-return Valve — An automatic device which permits the flow of a liquid in one direction only.

2.51 Nozzle; Spray Nozzle — A part or an assembly of parts having orifice which transforms the fluid being ejected under pressure into a spray (see 2.78).

2.51.1 Adjustable Nozzle — A hydraulic spray nozzle designed so that the shape of the spray may be altered without changing the components.

2.51.2 Air Blast Nozzle; Twin Fluid Nozzle — Appliance in which the spray is produced by the action of a high velocity air stream on the spray mixture.

2.51.3 Cone Nozzle — A hydraulic spray nozzle which produces a circular spray pattern.

2.51.4 Deflector Nozzle; Anvil Nozzle; Impact Nozzle — A hydraulic spray nozzle with a deflector producing a flat sheet of spray of full circular pattern of 25 to 180°.

2.51.5 Directional Nozzle — A type of nozzle which enables the direction of spray to be altered in relation to the angle of the supply tube or pipe.

2.51.6 Fan Nozzle; Slit Nozzle — A hydraulic spray nozzle with an opening in the shape of a slit, producing a flat sheet of spray.

2.51.6.1 Double fan (slit nozzle) — Fan nozzle having two separate openings.

2.51.6.2 Off-centre fan nozzle — Fan nozzle in which the spray angle and volume distribution are asymmetrical about the nozzle axis.

2.51.7 Hollow Cone Nozzle — A cone nozzle in which the formation of an air core within the orifice and the swirl chamber due to a high rotational velocity results in the production of a hollow cone of the liquid.

2.51.8 Hydraulic Spray Nozzle — A type of nozzle used for hydraulic spraying (see 2.83.3).

2.51.9 Impinging Stream Nozzle — A hydraulic spray nozzle designed so that spraying is achieved by the impact of two or more streams of liquid.

2.51.10 Multi-Head Nozzle; Turret Nozzle — Rotating assembly containing two or more nozzles any one of which may be brought into the operating position.

2.51.11 Pneumatic Spray Nozzle — A type of nozzle used for pneumatic spraying (see 2.83.6).

2.51.12 Shut-Off Nozzle — A nozzle with a shut-off device which may be used without changing parts.

2.51.13 Turbulence Nozzle — A hydraulic spray nozzle through which the liquid flows rotationally producing a conical spray (see 2.78.2).

2.52 Nozzle Bar — Rigid or flexible tube fitted to the end supplying the nozzles with spray liquid.

2.53 Nozzle Bar Section — Length of nozzle bar which can be supplied and controlled independently.

2.54 Nozzle Boss — The leg on the spray boom (see 2.81) to which the nozzle body or nozzle cap is fitted.

2.55 Nozzle Parts

2.55.1 Anvil; Deflector — A component of a nozzle which deflects the spray liquid after its emission from the nozzle orifice.

2.55.2 Body — The main component into or on which the other components of the nozzle are fitted.

2.55.3 Cap — The component which retains the assembled parts in or on the body.

2.55.4 Coupling Nut — A component which connects the nozzle to the spray lance.

2.55.5 Disc — The disc shaped component containing the final orifice of a cone nozzle (see 2.51.3) or some type of fan nozzles (see 2.51.6).

2.55.5.1 Blank disc — Device to prevent the flow from a nozzle when spraying.

2.55.6 Swirl Back Plate — Part of a particular type of turbulence nozzle which forms the rear part of the swirl chamber and the tangential liquid entry channels.

2.55.7 Swirl Chamber — The cavity between the nozzle disc and the swirl plate.

2.55.8 Swirl Plate; Swirl Core — The part of the cone nozzle (see 2.51.3) which imparts rotation to the liquid passing through it.

2.55.9 Tip — The component containing the final orifice of a fan nozzle (see 2.51.6) or of some type of cone nozzle (see 2.51.3).

2.56 Nozzle Spacing — The distance between centre to centre of adjacent nozzles on a spray boom (see 2.81).

2.57 Overflow Pipe — A pipe through which excess fluid from a pump is by-passed by the action of a relief valve or pressure regulator.

2.58 Patternator; Spray Distribution Bench — Device to assess the transverse volume distribution from a nozzle or spray boom.

2.59 Piston — A component for creating pressure or suction and pressure.

2.60 Piston Displacement — The volume displaced by the piston during one stroke.

2.61 Piston Rod — A rod or tube to help the movement of the piston.

2.62 Pressure Chamber — A chamber with or without air pressurization to even out the fluctuations of the liquid pressure and induce uniform flow of liquid. It is also known as air vessel, air bottle and air chamber.

2.63 Pressure Gauge — Instrument to indicate visually the pressure of a fluid.

2.64 Pressure Pulsation Damper — A device for reducing pressure pulsations.

2.65 Pressure Regulator — An automatic device to control the pressure of a fluid or gas within a range of settings.

2.66 Pressure Relief Valve — An automatic device which opens when the pressure of the fluid or gas reaches a predetermined value.

2.67 Protective Clothing Box — Box on the sprayer to store protective clothing (i.e. gloves, face shields, etc.).

2.68 Pump

2.68.1 Centrifugal Pump — A non-volumetric pump in which the liquid energy is increased by one or more impellers.

2.68.2 Diaphragm Pump — A volumetric pump in which the flow of the liquid is achieved by the operation of a diaphragm.

2.68.3 Gear Pump — A volumetric pump in which the flow of the liquid is achieved by gears.

2.68.4 Peristaltic Pump — A volumetric pump in which the flow of the liquid is achieved by the continuous progression of a flexible tube.

2.68.5 Piston Pump — A volumetric pump in which the flow of the liquid is achieved by the movement of a piston in a cylinder.

2.68.6 Roller Pump — A volumetric pump in which the flow of the liquid is achieved by the radial displacement of rollers placed in a rotor and in contact with an eccentric stator.

2.68.7 Vane Pump — A volumetric pump in which the flow of the liquid is achieved by the radial displacement or deformation of a vane placed or fixed in a rotor, and in contact with an eccentric stator.

2.68.8 Volumetric Pump — A pump in which the flow of the liquid is achieved by means of the variation in volume of one or more capacities which alternately sucks in and discharges the liquid.

2.69 Pump Cylinder — A component for guiding the movement of the piston.

2.70 Pump Output — Volume of liquid discharged by a pump per unit of time.

2.71 Quick-Acting Shut-Off Valve — A device enabling a spray system to be opened or closed instantly.

2.72 Safety Valve — An automatic valve which opens and relieves the pressure when it reaches a predetermined value thereby protecting the spray system and operator.

2.73 Seed Dresser — A machine to apply coating of protective chemical to seeds.

2.74 Seed Treatment — Application of a pesticide to seed prior to sowing.

2.75 Shutter (Air Flow Control) — A part of an appliance to control the flow of air.

2.76 Slope Compensator — Automatic or manual control system which keep the spray boom parallel to the ground.

2.77 Soil Injector — Appliance for injecting chemicals into soil.

2.78 Spray — The droplets produced by a nozzle.

2.78.1 Air Assisted Spray — Spray which is carried wholly or partly by a stream or flow of air.

2.78.2 Conical Spray — Spray with a conical shape.

2.78.3 Flat Spray — Spray with a flat shape.

2.78.4 Hydraulic Pressure Spray — Spray which is projected to the target by its own pressure.

2.78.5 Solid Stream Spray — Spray with a cylindrical shape.

2.79 Spray Angle — The angle formed close to a hydraulic spray nozzle by the edges of the spray.

2.79.1 Spray Angle, Nominal — Spray angle obtained at a reference pressure which characterizes a given type of nozzle.

2.80 Spray Area — Area covered by the spraying (see 2.83) expressed in hectare. In case of overhead spraying (see 2.83.4) this will be equal to the land area, in case of strip spraying (see 2.83.7) this will depend on row width and strip length and in case of plantation spraying (see 2.83.5) the height of the tree and strip length.

2.81 Spray Boom — A device on which the nozzles are mounted and which may form or support one or more pipelines which are carrying the liquid to the nozzle.

2.82 Sprayer — An appliance used for spraying (see 2.83).

2.82.1 Air-Assisted Centrifugal Sprayer — A centrifugal sprayer using an air flow to convey the droplets.

2.82.2 Air-Assisted Hydraulic Pressure Sprayer — A hydraulic pressure sprayer using an air flow to carry the droplets to the target.

2.82.3 Air Blast (Twin Fluid) Sprayer — Appliance with one or more air blast nozzles.

2.82.4 Centrifugal Sprayer — A sprayer used for centrifugal spraying (see 2.83.1).

2.82.5 Compression Sprayer — A hydraulic sprayer in which the liquid pressure is obtained by means of a previously compressed gas.

2.82.6 Hydraulic Pressure Sprayer — A sprayer used for hydraulic spraying (see 2.83.3).

2.82.7 Knapsack Sprayer — A sprayer which can be mounted on the back of the operator.

2.82.8 Pneumatic Sprayer — A sprayer used for pneumatic spraying (see 2.83.6).

2.82.9 Thermal Sprayer — A sprayer used for thermal spraying (see 2.83.8).

2.83 Spraying — The division and emission into the air of a liquid or a spray mixture in the form of droplets.

2.83.1 Centrifugal Spraying — Spraying performed by the use of centrifugal force imparted to the liquid by mechanical rotational energy, such as spinning disc.

2.83.2 Electrostatic Spraying — Process where electrostatic forces are used to air spray deposition.

2.83.3 Hydraulic Spraying — Spraying performed by the use of hydraulic energy.

2.83.4 Overhead Spraying — The spraying performed in the field on top of the crop.

2.83.5 Plantation Spraying — The spraying performed vertically to cover the height of the plant or trees.

2.83.6 Pneumatic Spraying — Spraying performed by the action of flow of gas.

2.83.7 Strip Spraying — The spraying performed on the field between the rows of the crop.

2.83.8 Thermal Spraying — Production of very small droplets either partly or wholly by thermal energy,

in such a dense cloud that visibility is impaired. It is also known as fogging.

2.83.9 Underleaf Spraying — Application where the spray is directed to the underside of the leaves.

2.84 Spray Coverage — Ratio of the target surface area covered by the spray droplets to the total target surface area.

2.85 Sprayer-cum-Duster — A sprayer which can be converted into a duster and *vice-versa*.

2.86 Spray Gun — A lance from which the spray is readily adjustable during the operation.

2.87 Spray Lance — A hand-held tube through which the liquid, after being released from cut-off device, reaches to nozzle.

2.88 Spray Lance Boom — Spray pipe attached to the end of spray lance on to which a number of nozzles are fitted.

2.89 Spray Lance Extension — A detachable tube for increasing the overall length of a spray lance (see 2.87).

2.90 Spray Leg (Drop Leg) — An auxiliary vertical spray boom fixed below a main horizontal spray lance (see 2.87).

2.91 Spray Mixture — Liquid containing the diluted formulated product ready for spraying (see 2.83).

2.92 Spray Overlap — Amount by which the spray from adjacent nozzles overlap, as measured at the target surface level.

2.93 Spray Penetration — Spray entering and being deposited within the inner part of the foliage canopy.

2.94 Spray Rate — Amount of active ingredient of pesticide applied per unit area.

2.95 Spray Tank — The part of the sprayer which contains the spray liquid or mixture.

2.96 Spray Tank Contents Gauge — Device to indicate visually the volume of liquid in the tank.

2.97 Spray Volume — Total volume of spray mixture applied to an area.

2.97.1 High Volume (HV) — Spray volume more than 560 litres per hectare.

2.97.2 Low Volume (LV) — Spray volume more than 5.6 and less than 56 litres per hectare.

2.97.3 Medium Volume (MV) — Spray volume more than 56 and less than 560 litres per hectare.

2.97.4 Ultra-Low Volume (ULV) — Spray volume more than 0.56 and less than 5.6 litres per hectare.

2.97.5 Ultra-Ultra-Low Volume (U-ULV) — Spray volume less than 0.56 litre per hectare.

2.98 Spreader — A component for holding the piston in its shape and position.

2.99 Spread Factor — Ratio of the diameter of the contact area produced by a droplet after it has been deposited on a given surface to the actual diameter of the droplet.

2.100 Strainer (Filter) — The component for separating foreign matter from the spray liquid.

2.100.1 Nozzle Strainer (Filter) — Component, fitted behind the nozzle tip, which removes foreign bodies from the spray mixture so preventing nozzle blockage.

2.100.2 Suction Strainer — A device situated at the bottom of the tank or on the end of the suction preventing undesirable solids from entering the spray system.

2.101 Swath — Distance between successive passes of a sprayer or spreader.

2.102 Swath Marker; Bout — Device at the boom ends to indicate the extremity of the spray swath (for example, by foam spots).

2.103 Tank Sump — Depression in the bottom of the spray tank into which the suction strainer and pump inlet are attached.

2.104 Throw — The distance reached by the jet or spray.

2.105 Tramline — Field marking system involving driving the spreader or sprayer along tracks established when sowing or drilling.

2.106 Transverse Distribution — Variation in volume or mass of spray liquid or granules deposited over the treated area transverse to the direction of travel.

2.107 Trigger or Screw Mechanism — A device which actuate the valve to control the spray pattern.

2.108 Trigger Lock — A device by which the trigger position can be locked while spraying.

2.109 Valve Assembly — A device provided to check or to allow the flow of fluid, air or dusting powder.

2.110 Volume Median Diameter (VMD) — The droplet size that divides the spray into two equal parts by volume, one half containing droplets smaller than this diameter, the other half containing larger droplets.

2.110.1 Aerosols — The distribution of droplets with a VMD value of below 50 µm.

2.110.2 Coarse Spray — The distribution of droplets with a VMD value of more than 400 µm.

2.110.3 Fine Spray — The distribution of droplets with a VMD value in the range of 100 µm and 400 µm.

2.110.4 Mist — The distribution of droplets with a VMD value in range of 50 µm and 100 µm.

2.111 Volumetric Efficiency — The quotient of the actual volume of the spray fluid discharged in one cycle and the piston displacement in the same cycle.

2.112 Volume-Hectare — Volume of spray liquid distributed by a sprayer over an area of 1 hectare.

2.113 Wiper — Device such as a brush or rope for applying pesticide to the target surface by direct contact.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission of BIS in writing. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : FAD 25 (443).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 83 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Telephone

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 323 76 17 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola CALCUTTA 700054	{ 337 84 99, 337 85 61 337 86 26, 337 86 62
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 38 43 60 20 25
Southern	: C.I.T. Campus, IV Cross Road, MADRAS 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Mankalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR.
COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD,
JAIPUR. KANPUR. LUCKNOW PATNA. THIRUVANANTHAPURAM.